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Titolo	Machine Learning Applied to Composite Materials [[electronic resource] /] / edited by Vinod Kushvaha, M. R. Sanjay, Priyanka Madhushri, Suchart Siengchin
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Descrizione fisica	1 online resource (202 pages)
Collana	Composites Science and Technology, , 2662-1827
Disciplina	006.31
Soggetti	Composite materials Machine learning Computational intelligence Materials science - Data processing Composites Machine Learning Computational Intelligence Computational Materials Science Materials compostos Simulació per ordinador Aprenentatge automàtic Llibres electrònics
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Importance of machine learning in material science -- Machine Learning: A methodology to explain and predict material behavior -- Effect of aspect ratio on dynamic fracture toughness of particulate polymer composite using artificial neural network -- Methodology of K-Nearest Neighbor for predicting the fracture toughness of polymer composites -- Forward machine learning technique to predict dynamic fracture behavior of particulate composite -- Predictive modelling of fracture behavior in silica-filled polymer composite subjected to impact with varying loading rates -- Machine learning approach to determine the elastic modulus of Carbon fiber-reinforced laminates -- Effect of

	weight ratio on mechanical behaviour of natural fiber based biocomposite using machine learning -- Effect of natural fiber's mechanical properties and fiber matrix adhesion strength to design biocomposite -- Comparison of various machine learning algorithms to predict material behavior in GFRP.
Sommario/riassunto	This book introduces the approach of Machine Learning (ML) based predictive models in the design of composite materials to achieve the required properties for certain applications. ML can learn from existing experimental data obtained from very limited number of experiments and subsequently can be trained to find solutions of the complex non-linear, multi-dimensional functional relationships without any prior assumptions about their nature. In this case the ML models can learn from existing experimental data obtained from (1) composite design based on various properties of the matrix material and fillers/reinforcements (2) material processing during fabrication (3) property relationships. Modelling of these relationships using ML methods significantly reduce the experimental work involved in designing new composites, and therefore offer a new avenue for material design and properties. The book caters to students, academics and researchers who are interested in the field of material composite modelling and design.